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# LIVING THE High life

## *Wildlife of Utah's mountain forests*

ACROSS UTAH, 41 distinct mountain ranges rise skyward. Even though Utah is the second driest state in the nation, these mountains capture enough precious rain and snow from the clouds rising up their flanks to allow forests of pines, oaks, aspens, spruces, firs and many other trees to grow. These forests provide a wealth of habitat for many species of wildlife.

The mountains in Utah rise dramatically from its desert landscape. This sharp increase in elevation results in a variety of life zones within a relatively small area. A life zone is a vegetation community dominated by one or two species of plants. At increasing elevations from the base of a mountain to its summit, four major life zones can be encountered: the transition or foothills zone; the Canadian or montane zone; the Hudsonian or subalpine zone; and the alpine zone.

The plant communities making up these life zones vary according to elevation, latitude and soil type. The zones are not usually distinct, and in most places they show a gradual transition as one community ends and an adjacent one begins. These zones of transition are called edges, or ecotones. Ecotones offer a mixture of the two adjacent plant communities and thus offer more diversity than either community on its own. This greater diversity in vegetation, in turn, supports a greater diversity of wildlife.

Since animals do not occur randomly in nature, each of Utah's life zones provide habitat to certain wildlife species. Some species are tied very closely to a particular life zone plant community and others are more generalists, capable of living in a wider range of life zones. Several of Utah's mountain species, and the physical and behavioral adaptations they have that allow them to live where they do, are described below.

### Life zones of Utah's mountains

**Alpine** *(above 11,200 to 12,000 feet, depending on latitude)*

Wind and cold shape the alpine life zone to look like the arctic tundra. One hundred mile per hour winds, average annual temperatures below freezing and limited effective precipitation create a treeless, barren looking landscape. But if you look closely, you'll discover an abundance of life. Twisted bristlecone pine growing on rocky outcrops border the alpine zone. Beyond the trees, dwarf wil-

PHOTO BY JOHN PRATT

**Utah's green mountains are a stark contrast to the state's desert areas.**

PHOTO BY © KIRK GARDNER

**Aspen forests like this dominate much of Utah's high country.**

lows and myriad miniature cushion-like plants carpet the ground. Most are slow-growing perennials, short, with small parts except the flower, and their leaves are often covered by a protective cuticle or dense hairs to reduce water loss. In Utah, you can find the alpine life zone in the Uinta Mountains.

**Hudsonian or subalpine**
*(9,500 feet to the tree line)*

The tangled spruce-fir forest is the dominant plant community in this life zone. The climate is cold, windy and moist, with most of the precipitation falling in the form of snow. Snow pack remains well into summer and the frost-free season lasts only two months. The dense stands of conifers modify the harsh climate by reducing wind speed and radiation intensity and by preventing moisture loss. Englemann spruce-subalpine fir forest is the climax community because no other trees can grow in their shade at this elevation. The area around the town of Alta is a good example of the Hudsonian life zone.

**Canadian or montane**
*(8,000 to 9,500 feet)*

At this elevation in Utah, you might find a forest dominated by lodgepole pine, ponderosa pine, aspen or Douglas fir. The dominant plant community is dictated by slope orientation, soil type and soil moisture. All the forests at this elevation harbor critical habitats for many species of wildlife. Ponderosa pine forests can be found on Elk Ridge in the Abajo Mountains. Douglas fir forests are common in the Tushar Mountains. Lodgepole pine forests spread across the north slopes of the Uintas.

**Transition or foothills**
*(5,500 to 8,000 feet)*

The most common plant communities at this elevation in Utah are pinyon-juniper woodlands and oak-maple shrublands. Pinyon-juniper woodlands cover nine million acres in Utah. This "pygmy" forest occupies warm, dry sites with mean annual temperatures between 45 degrees and 55 degrees Fahrenheit. The frost-free season is usually more than 80 days. Thick stands of oak-maple shrublands ring many of Utah's mountains. This plant community is often intermixed with mountain mahogany and provides important habitat to a diverse animal community.

Some of the wildlife that live in Utah's mountain forests include the following:

**Northern goshawk** *(Accipiter gentiles):*

The Northern goshawk makes its home in the dense subalpine spruce-fir forests of Utah's mountains. One of the fiercest and most aggressive raptors, the goshawk has a reputation for being an especially adept killer, hunting grouse, squirrels, snowshoe hares, songbirds and smaller hawks. Having short rounded wings and a long tail, which allow it to maneuver with extreme skill and agility, the goshawk is very well adapted to hunting in the wooded areas where it lives. The goshawk

is the largest of three North American raptors known as accipiters. Accipiter, its genus name, is derived from the Greek words aci, which means "swift" and petrum, which means "wing." Northern goshawks build their nests with twigs, grasses and other plant material. Females may lay one to three eggs each breeding season. It takes about 30 to 35 days for the eggs to hatch. Young hawks grow quickly and leave the nest in 30 to 60 days. The goshawk is fearless in defense of its nest and will boldly attack anyone who ventures too close. Although goshawk populations in the West are considered stable, concerns exist about the impacts that logging old-growth forests might have on the species.

**Pika** *(Ochotona princeps):*

Pikas, known also as "rock rabbits," live among the rocky alpine talus slopes found at elevations above timberline. Their small, rounded, nearly tailless bodies and their gray-colored fur, which matches perfectly with the rocks they live among, make them difficult to spot. It's their sharp, whistle-like "jeep" warning call—piercing the alpine air—that usually gives them away. Pikas utter these calls to announce the presence of danger to other members of the colony. Pikas do not hibernate during the winter but instead live off of dried piles of grasses and forbs they collect and store during the short high country summer. Clipped vegetation from a nearby meadow is stacked onto a "hay pile" in an area of the pika's territory that is partially exposed to sunlight so the hay can cure. To avoid raids on their hay piles by other pikas, they mark the boundaries of their territories with scent from glands on their cheeks.

**Smooth green snake**
*(Liochlorophis vernales):*

As its name suggests, this species of snake is primarily green in color. It's actually the same color as fresh green grass, which is appropriate since this snake resides in moist, grassy areas of meadows, marshes and fields along forest edges. Measuring 15 to 30 inches, this snake is so swift and well adapted to hiding in its environment that few people ever get a chance to see one. Usually they hide under rocks or other naturally occurring litter. Sometimes they can be seen sunning themselves on low branches of trees or on shrubs where they forage for insects and spiders, which make up the bulk of their diet. In Utah, they occur in the Wasatch, Uinta, Abajo and La Sal mountains, and the East Tavaputs Plateau, at elevations up to 9,500 feet. They are not common and have been listed on the Utah Sensitive Species List. Since they are cold-blooded and would not survive the cold conditions of winter, smooth green snakes hibernate in the winter, often together, in small mammal burrows or other underground shelters below the frost line.

**Red crossbill** *(Loxia curvirostra):*

The Red crossbill is readily identified by its distinctive bill that, as the bird's name implies, crosses at the tip. It lives in coniferous forests, where trees that bare the seed cones upon which they almost exclusively feed are abundant. The species is moderately common in appropriate habitat in Utah. Holding a cone with one foot, the bird first inserts its closed bill between the cone and the scales. It then pries the scales apart by opening its bill, and uses its flexible tongue to extract the seed. Being highly dependent on pine seeds, the red crossbill is an erratic and nomadic species. In its search for an abundant crop of conifer seeds, it may travel as far south as Mexico, but does not truly migrate. Red crossbills will breed at almost any time of the year when food is plentiful. The nest, built by the female, is usually found on the horizontal branch of a conifer, away from the trunk. Chicks are fed regurgitated seed pulp. The tips of their bills are not crossed when they hatch but cross gradually, shortly after they fledge.

**Snowshoe Hare** *(Lepus americanus):*

The snowshoe hare is a resident of Utah's Douglas fir, lodgepole pine and aspen forests of the subalpine zone. In summer they are brown and in winter they are white—the perfect way to stay out of sight. Because it changes color to match with the winter's snow, the snowshoe hare is also sometimes called the varying hare. Their other name comes from the especially large, thickly furred hind feet they have. These large furry feet, up to six inches long, act like snowshoes to support them as they dash across deep snow, and give them traction on icy crusts. This comes in handy when a snowshoe hare is being chased by a bobcat or one of its many other predators looking for a meal. Summer food for the snowshoe hare itself consists of a variety of tender green plants. In winter it feeds upon bark, twigs of alder, aspen, willow and other deciduous trees and shrubs, and the shoots of evergreens.

**Boreal Toad** *(Bufo boreas boreas):*

The boreal toad is a mountain toad that lives within subalpine and alpine meadows at elevations between 6,000 to 11,000 feet. A subspecies of the western toad, they breed in a variety of shallow wetlands such as small pools, bogs, beaver ponds, marshy edges of mountain lakes and backwaters of creeks and rivers. Being cold-blooded, to survive the freezing temperatures of winter, boreal toads must hibernate within an underground burrow below the frost line. Ice and snow lock the toads in their hibernation burrows for eight to nine months at a time. Some cold climate amphibians have an antifreeze-substance in their blood that makes hibernation in cold climates possible. It is unknown if boreal toads contain this substance. When they emerge from their burrows boreal toads feed on a wide range of insects and other invertebrates. Boreal toads were plentiful along montane lakes in the Wasatch and Uinta mountains as late as the 1970s. Today only a few populations still remain and the species is included on Utah's Sensitive Species list. Research has not been able to provide conclusive answers explaining boreal toad declines, but a combination of factors, including loss and degradation of habitat, environmental contaminants, disease and ozone layer depletion and associated increased UV radiation may all be involved.

**Northern flying squirrel**
*(Glaucomys sabrinus):*

Flying squirrels, despite their name, don't actually fly. A loose fold of skin known as the patagium stretches between their front and hind legs allowing them to glide or "volplane" for distances of 100 feet or more. Climbing high in a tree, a flying squirrel leaps with its legs extended and patagium outstretched, gliding in a descending curve towards another tree. As the squirrel approaches its landing, it flips up its tail and holds its body back to slow down for a safe landing. In Utah, northern flying squirrels primarily live in mature coniferous forests and riparian zones. Flying squirrels eat various nuts, fungi, berries, seeds, lichens, insects and sometimes the eggs of songbirds. Good tree cover is needed to enable flying squirrels to glide between trees. Older trees and snags supply the hollow cavities necessary for nesting sites. Northern flying squirrels are nocturnal. To help them see well in the darkness of night, they have especially large eyes. During the day they hide away in their nests.

**Mountain goat**
*(Oreamnos americanus):*

The dense, long white fur of the mountain goat complements the snowy mountain peaks upon which this species lives. It also provides them with the insulation essential to survive the extremes of winter at high altitudes. Occupying the steep, rugged cliffs of the alpine's mountain peaks, mountain goats are well suited to their extreme and precarious abode. Short legs and a low center of gravity help them to be excellent rock climbers able to move with ease along narrow ledges and steep precipices. Their hooves also contribute to their surefootedness in their rocky and icy environment. The undersides of the hooves are concave and spongy,

adhering to rocks too slippery for hard shiny hooves. The outer edges of the hooves are also very hard and facilitate griping of hard surfaces. Mountain goats graze on a variety of grasses, sedges, mosses and lichens, and browse on the foliage of some trees and shrubs. Not close relatives of domestic goats, they actually belong to a small group of ungulates known as rock goats. Members of this group possess short, dagger-like horns, and bones in the skull that are thin and light. They do not engage in head butting but their horns can inflict serious injury to rivals or predators.

**Porcupine**

*(Erethizon dorsatum):*

Porcupines are common in Utah's mountains. They prefer coniferous forest and mixed forest areas associated with the montane life zone. Being rodents (the second largest in North America), porcupines pos-

sess large front gnawing incisors. In winter they use these incisors to chew through the tough outer bark of various evergreens and hardwoods to get at the nutritious inner bark (cambium layer) upon which they subsist. Skilled climbers, to get into the upper parts of tree where they feed and rest, porcupines employ their long, curved claws and special knobby, gripping pads on the bottom of their feet. On the ground, porcupines are, at best, capable of only a slow lumbering gallop. So for protection from predators such as mountain lions, bobcats and coyotes, they rely on their trademark sharp, pointy quills.

**Black bear**

*(Ursus americanus):*

In Utah, black bears inhabit large forested areas of Gamblel oaks, conifers and moist creek bottoms. In winter they select areas with caves or where dens can be dug out from under the roots of large trees or piles of large rocks. Throughout the spring, summer and fall, bears, feed on almost anything they can find from vegetative matter such as roots, tubers, bulbs, berries, succulent leaves of hardwoods, grasses and nuts, to other critters such as frogs, reptiles, small mammals, fish, ants and other insects. They will also feed on winter-killed animals and other carrion. To chew all these types of food, bears have flat grinding molars in the back of their mouths and long, pointed canine teeth up front. They also have long, sharply curved, 1_ inch long claws they can use for digging up food or digging their dens. Bears eat all summer to build up the thick layer of fat they need to sustain them through the winter. They enter their dens in November and spend the next six months in a dormant state that is technically not hibernation but is called a deep sleep, or torpor. While in their dens, their temperature drops only eight to 10 degrees and their metabolism and heart rate decrease only slightly.

**Mule deer**

*(Odocoileus hemionus):*

The mule deer gets its name from its large ears that measure up to 11 inches long and resemble those of a mule. Though these large ears allow it to detect approaching danger, a mule deer's best defense is its speed. To escape danger, a mule deer can run up to 35 miles per hour for short periods and leap up to 25 feet in a single bound. Fawns also have special adaptations to protect them from predators, including white-spotted coloration for camouflage, an instinctive ability to remain still, and a complete lack of scent. Mule deer are browsers and rely on many different plants for their nutrition. Shrubs and brush such as mountain mahogany, bitterbrush, scrub oak, willow and a wide variety of forbs and grasses make up their diet. Feeding habits vary with the changing seasons and it is thought mule deer have the ability to select

the plants with the highest nutritional value at different times of the year. They can also physiologically adjust their digestive system to accommodate changes in their diet. Migrating seasonally to different elevations, ecotones, areas that offer a greater variety of vegetation, are most preferred by mule deer. During winter and early spring, when there is little ground forage, mule deer subsist on a starvation diet of twigs and branches that provide little nutrition. During these periods, the mule deer use stored body fat to survive. Some can lose up to 20 percent of their body weight, and ultimately, winter survival depends on the weather, stored fat reserves and a deer's ability to conserve precious energy.

**WILD educator resources**
Request these items from Project WILD by calling (801) 538-4719 or e-mailing DianaVos@utah.gov.

- Colorful, poster-sized Life Zone map of Utah.
- Utah's Mountain Life Zones Coloring Pages and Information — http://www.wildife.utah.gov/projectwild/lifezones
- Wildlife Photo Series No. 1 and the newly created Wildlife Photo Series No. 2: Set of 16 photo cards (each set) featuring Utah species with natural history information for each on the reverse side. $7.00 each.
- Lists of Common Plants and Animals of Utah's Wetlands, Mountains and Deserts.
- Rainfall and the Forest: Copy of activity, supplemental Utah vegetation, elevation and precipitation maps, and Utah precipitation data to conduct this excellent Project WILD activity.
- Forest, Deserts and Wetlands Trunks: Three separate trunks featuring different environments of Utah for loan to educators. Each contains background information articles, comprehensive activity guides, posters, puppets, children's books, videos and more.
- Wildlife of Utah— A Photo Essay: Beautiful, full-color book highlighting Utah's different environments and wildlife species found within each. $6.00.
- Project WILD's *Growing WILD* past newsletters: Download copies of back issues featuring Utah's Deserts, Mountains, Wetlands, Riparian areas and more. See http://www.wildlife.utah.gov/projectwild/newsletter_archive.html.
- Utah's "Wildlife Notebook Series" Fact Sheets: Four-page leaflet series featuring 17 different Utah wildlife species including the American Black Bear, Marten, Rocky Mountain Elk, Great Blue Heron, Kit Fox, Kokanee and several other species. Download copies from http://www.wildlife.utah.gov/publications/notebook.html.

**WILD about reading**
Books for Learning More:

- *The Great Rocky Mountain Nature Factbook:* A guide to the Region's Remarkable Animals, *Plants & Natural Features* by Susan Ewing, West Wing Press, 1999.
- *Mountain Animals* by Francine Galko, Heinemann Library, Animals In their Habitats Series, 2003.
- *High Mountains: Living on the Edge* by Wendy Pfeffer, Benchmark Books, 2003.
- *Forest Animals* by Christopher Butz, Steck-Vaughn Co., 2002.
- *What Is a Forest?* by Bobbie Kalman, Crabtree Pub., 2002.
- *The Temperate Forest: A Web of Life* by Philip Johansson, Enslow Pub. Inc., 2004.
- *Temperate Forest* by Greg Reid, Chelsea House Pub., 2004.
- *Pine Trees* by Allan Fowler, Children's Press, 2002.
- *Rocky Mountain Tree Finder a Manual for Identifying Rocky Mountain Trees* by Tom Watts, Nature Study Guide, 2003.

**Related Web sites:**
- Utah Conservation Data Center: Online information, map and image of each of Utah's wildlife species found at http://dwrcdc.nr.utah.gov/ucdc/.

**Getting WILD!**
Utah's WILD Notebook is produced by Utah's Project WILD program. WILD workshops, offered by the Utah Division of Wildlife Resources, provide teachers and other educators with opportunities for professional development and a wealth of wildlife education activities and materials for helping students learn about wildlife and its conservation. For a current listing of Project WILD educator workshops, visit the Project WILD Web site at wildlife.utah.gov/projectwild or e-mail DianaVos@utah.gov.